

- 1 1. A power management circuit, comprising:
2 first and second switching elements coupled across first and second rails for
3 energizing a load; and
4 a first power control circuit coupled to the first switching element, wherein the
5 first power control circuit biases the first switching element to a non-conductive state for
6 a portion of a half cycle of an AC signal for energizing the load during which a peak
7 voltage of the AC half cycle occurs when a voltage across the first and second rails is
8 greater than a predetermined threshold.
- 1 2. The circuit according to claim 1, wherein a duration of the first switching element
2 being in the non-conductive state is centered about the peak voltage of the AC half cycle.
- 1 3. The circuit according to claim 1, wherein the power control circuit includes a
2 potentiometer coupled across the first and second rails for setting the predetermined
3 threshold.
- 1 4. The circuit according to claim 3, further including a control switching element
2 coupled to the potentiometer for biasing the first switching element to the non-conductive
3 state when a voltage across the potentiometer is greater than a level corresponding to the
4 predetermined threshold.
- 1 5. The circuit according to claim 4, further including a storage capacitor for biasing the
2 first switching element to a conductive state.
- 1 6. The circuit according to claim 1, wherein the predetermined threshold is above an
2 expected peak of the AC half cycle for providing overvoltage protection.

- 1 7. The circuit according to claim 1, wherein the predetermined threshold is below an
2 expected peak of the AC half cycle.
- 1 8. The circuit according to claim 1, further including a control switching element
2 coupled to the first switching element and a sense resistor coupled between the first rail
3 and the first switching element such the control switching element biases the first
4 switching element to the non-conductive state when a current level through the first
5 switching element is greater than a predetermined current threshold.
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1 9. The circuit according to claim 1, further including a bulk capacitor, wherein the bulk
2 capacitor is charged to the predetermined voltage threshold.
- 1 10. The circuit according to claim 1, wherein the first switching element forms part of a
2 Darlington pair.
- 1 11. The circuit according to claim 10, wherein the Darlington pair, the load and the
2 second switching element are coupled end-to-end across the first and second rails.
- 1 12. The circuit according to claim 11, wherein the load is disposed between the first and
2 second switching elements.
- 1 13. The circuit according to claim 10, further including a first diode coupled across the
2 first switching element and a second diode coupled across the second switching element.
- 1 14. The circuit according to claim 1, further including referencing voltage levels to a
2 single rail.
- 1 15. The circuit according to claim 14, wherein the single rail corresponds to a
2 conventional black wire terminal and a second white wire terminal is relatively
3 inaccessible.

1 16. The circuit according to claim 14, further including a high impedance resistor for
2 coupling to the load to minimize ground fault current.

1 17. The circuit according to claim 1, further including referencing voltage levels to
2 ground.

1 18. The circuit according to claim 17, further including conventional white and black
2 input terminals for receiving an AC input signal, wherein the white terminal is adapted
3 for coupling to the load.

1 19. The circuit according to claim 18, further including a high impedance resistor for
2 coupling to ground, wherein a potential difference between ground and the white terminal
3 corresponds to current through the high impedance resistor.

1 20. A circuit having power management, comprising:
2 first and second switching elements coupled between first and second rails for
3 energizing a load;
4 a first power control circuit for controlling a conductive state of the first switching
5 element;
6 a second power control circuit for controlling a conductive state of the second
7 switching element;
8 wherein the first power control circuit includes a control device coupled between
9 the first and second rails and connected to a control switching element, such that the
10 control device biases the control switching element to a conductive state, which biases the
11 first switching element to a non-conductive state, when a voltage across the first and
12 second rails is greater than a predetermined threshold defined by the control device.

1 21. The circuit according to claim 20, wherein the first power control circuit includes a
2 sense resistor coupled to the first switching element for biasing the control switching

3 element to the conductive state then a current through the sense resistor is greater than a
4 predetermined current threshold.

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1 22. A circuit, comprising:

2 first and second input terminals for receiving an input AC signal;

3 first and second diodes coupled end-to-end across first and second rails such that
4 the first input terminal is coupled to a point between the first and second diodes;

5 a switching circuit including at least one switching element coupled across the
6 first and second rails via a sense resistor;

7 a clamp switching element having first, second, and third terminals, the first and
8 second terminals being coupled across the first and second rails, the first terminal being
9 coupled to the first switching circuit, and the third terminal being coupled to the sense
10 resistor, wherein the sense resistor biases the clamp switching element to a conductive
11 state, which biases the switching circuit to a non-conductive state, when a voltage across
12 the first and second rails is greater than a predetermined threshold.

1 23. The circuit according to claim 22, further including a capacitor coupled across the
2 sense resistor for maintaining the clamp switching element in the con-conductive state.

1 24. The circuit according to claim 22, further including third and fourth diodes coupled
2 end to end across the first and second rails, wherein the load is coupled between the
3 second terminal and a point between the third and fourth diodes.

1 25. A method of managing power in a circuit, comprising:

2 selecting a voltage threshold at which an AC signal will be clamped such that a
3 switching element for energizing a load is biased to a non-conductive state during a time
4 that the AC signal is above the voltage threshold.

1 26. The method according to claim 25, further including centering the time of non-
2 conduction for the switching element symmetrically about a peak of the AC signal.

1 27. The method according to claim 25, further including charging a storage capacitor to
2 the voltage threshold level.

1 28. The method according to claim 25, further including generating four current surges
2 for each cycle of the AC signal.

1 29. The method according to claim 25, further including biasing the switching element
2 to the non-conductive state when a current through the switching element is greater than a
3 predetermined current threshold.

1 30. The method according to claim 25, further including selecting the threshold voltage
2 using a potentiometer.

1 31. The method according to claim 25, further including setting the threshold voltage
2 above an expected voltage peak of the AC signal to provide overvoltage protection.

1 32. The method according to claim 25, further including modifying the threshold voltage
2 to provide dimming of a lamp.

1 33. A method of managing power in a circuit, comprising:
2 providing first and second switching elements across first and second rails for
3 energizing a load;
4 coupling a first control circuit to the first switching element and a second control
5 circuit to the second switching element;
6 coupling a potentiometer across the first and second rails; and
7 coupling a control switching element to the potentiometer such that the
8 potentiometer biases the control switching element to a state that biases the first
9 switching element to a non-conductive state when a voltage across the first and second
10 rails is greater than a predetermined threshold selected by the potentiometer.

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1 34. The method according to claim 32, further including coupling a sense resistor to the
2 first switching element and to the control switching element such that the sense resistor
3 biases the control switching element to the state that the biases the first switching element
4 to the non-conductive state when a current through the sense resistor is greater than a
5 predetermined current level to provide current surge protection.

1 35. The method according to claim 32, further including selecting the threshold voltage
2 above an expected peak voltage of an AC signal for energizing the load to provide
3 overvoltage protection.

1 36. The method according to claim 32, further including centering a time during which
2 the first switching element is non-conductive about a peak of an AC signal for energizing
3 the load.

1 37. The method according to claim 32, further including adjusting the voltage threshold
2 to provide dimming of a lamp.